

## PATENT COOPERATION TREATY



## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference<br>SMC 60553/WO  | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |  |
| International application No.<br>PCT/GB 03/03837   | International filing date (day/month/year)<br>04.09.2003  | Priority date (day/month/year)<br>12.10.2002 |
| International Patent Classification (IPC) or both national classification and IPC<br>C09D11/00 |   |  |
| Applicant<br>AVECIA LIMITED et al.   |   |  |

|    |   |
|----|---|
| 1. | This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.  |
| 2. | This REPORT consists of a total of 6 sheets, including this cover sheet.<br><br><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).<br><br>These annexes consist of a total of 2 sheets.   |
| 3. | This report contains indications relating to the following items:<br><br>I <input checked="" type="checkbox"/> Basis of the opinion<br>II <input type="checkbox"/> Priority<br>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability<br>IV <input checked="" type="checkbox"/> Lack of unity of invention<br>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement<br>VI <input type="checkbox"/> Certain documents cited<br>VII <input type="checkbox"/> Certain defects in the international application<br>VIII <input type="checkbox"/> Certain observations on the international application |

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| Date of submission of the demand<br><br>03.03.2004  | Date of completion of this report<br><br>14.01.2005   |
| Name and mailing address of the international preliminary examining authority:<br><br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465 | Authorized Officer<br><br>Schmitz, V<br><br>Telephone No. +49 89 2399-6034<br><br> |

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/03837

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-7 as originally filed

**Claims, Numbers**

1-14 received on 11.10.2004 with letter of 07.10.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

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**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
  - ☐ the entire international application,
  - ☒ claims Nos. 14because:
  - ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
  - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
  - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
  - ☒ no international search report has been established for the said claims Nos. 14
2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:
  - ☐ the written form has not been furnished or does not comply with the Standard.
  - ☐ the computer readable form has not been furnished or does not comply with the Standard.

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:
  - ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☒ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
  - ☐ complied with.
  - ☐ not complied with for the following reasons:
4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:
  - ☐ all parts.

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International application No. **PCT/GB 03/03837**

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☒ the parts relating to claims Nos. 1-13 .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims |      |
|                               | No: Claims  | 1-13 |
| Inventive step (IS)           | Yes: Claims |      |
|                               | No: Claims  | 1-13 |
| Industrial applicability (IA) | Yes: Claims | 1-13 |
|                               | No: Claims  |      |

**2. Citations and explanations**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB 03/03837

**Reference is made to the following documents:**

D6: PATENT ABSTRACTS OF JAPAN vol. 008, no. 145 (C-232), 6 July 1984  
(1984-07-06) -& JP 59 053565 A (DAINIPPON TORYO KK;OTHERS: 01), 28  
March 1984 (1984-03-28)

**Re Item I**

**Basis of the opinion**

The basis of this opinion are the claims 1-13 filed with the letter of 07.10.2004

**Re Item IV**

**Lack of unity of invention**

The search authority established 2 inventions (invention 1: claims 1-13 and invention 2: claim 14) in the originally filed claims. The applicant did not follow the invitation to pay additional search fees for the second invention and thus the International Search Report is based on the searched first invention, namely claims 1-13, only.

A Written opinion can be only based on searched subject matter.

Consequently this Written Opinion is also based on the first invention established in the International Search Report, namely claims 1-13.

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.**

**1. Article 33(2) PCT**

- 1.1 Claim 1 discloses a process for printing a porous substrate comprising ink jet printing a dye and casein onto the substrate in which the dye and the casein are in contact with each other and wherein the casein is applied as a composition comprising a

liquid medium, the liquid medium comprises water and a water miscible organic solvent, the weight ratio of water to water-miscible organic solvent is from 95:5 to 70:30 and the dye has a solubility in the liquid medium of at least 10% by weight at 20 °C.

Such a process is implicitly disclosed in D6 (abstract).

Therefore the subject matter of Claim 1 lacks novelty.

- 1.2 The subject matter of claim 10 is an ink comprising a 0.1 to 15 parts of a dye, 0.1 to 10 parts casein and 99.8 to 74.9 parts of a liquid medium wherein the liquid medium comprises water and a water miscible organic solvent, the weight ratio of water to water-miscible organic solvent is from 95:5 to 70:30 and the dye has a solubility in the liquid medium of at least 10% by weight at 20 °C.

Such an ink is disclosed in the abstract of D6. D6 describes an jet ink composition comprising 0.1-15 wt.% of a water soluble dye, 5-40 wt.% of a wetting agent, water and 0.1-5 wt% of casein. The solubility of the dye (at least 10 % by weight at 20 °C) disclosed in the present claims is regarded as implicitly disclosed in D6. The wetting agents of D6 are water miscible organic solvents (eg. diethylene glycol, triethylene glycol or glycerin) and the ranges of the weight % content of the wetting agents are overlapping with the ranges of the water miscible organic solvent of the present application. The casein is also present in an overlapping range as in the present application.

Thus the subject matter of claim 10 is not novel.

- 1.3 The subject matter of claim 11 lacks novelty over D6 (abstracts). The 1,2-benzisothiazolin-3-one is regarded as implicitly disclosed.

## **2. Article 33(3) PCT**

- 2.1 Since the subject matter of the claims 1-13 is anticipated by D6 (see above) it is, therefore, not regarded as involving an inventive step (Article 33(3) PCT).

## **3. Industrial Applicability**

- 3.1 The subject matter of the claims 1-13 is industrial applicable.

CLAIMS**REPLACED BY  
ART 34 A/DT**

1. A process for printing a porous substrate comprising ink jet printing a colorant and casein onto the substrate to give a print in which the colorant and casein are in contact with each other.

2. A process according to claim 1 wherein the colorant and the casein are printed onto the substrate separately.

3. A process according to claim 1 or 2 wherein the colorant and casein are in printed from different ink jet cartridges or are printed from separate chambers of a one ink jet cartridge.

4. A process according to claim 1 wherein an ink comprising the casein and colorant is printed onto the substrate.

5. A process according to claim 1 wherein the casein is printed onto the substrate in a first step and a composition comprising casein and colorant is printed onto the substrate in a second step to substantially the same area as the casein.

6. A process according to any one of the preceding claims wherein the substrate has high levels of voids within its structure.

7. A process according to any one of the preceding claims wherein the substrate comprises filler and binder in a weight ratio of at least 2:1.

8. A process according to claim 7 wherein the filler is clay, calcium carbonate, magnesium carbonate, silica, zeolite, alumina or a combination of two or more thereof.

9. A process according to claims 1 to 5 wherein the casein is substantially free from di and trivalent metal ions.

10. An ink comprising:

- (i) 0.1 to 10 parts casein calculated on a 100% solids basis;
- (ii) 0.1 to 15 parts colorant; and
- (iii) 99.8 to 74.9 parts of a liquid medium;

wherein all parts are by weight, (i) + (ii) + (iii) add to 100 parts and the ink comprises less than 0.1% by weight of di- and tri-valent metal ions.

REPRODUCED BY  
ART 34 AND DT

11. An ink comprising:

- (i) 0.1 to 10 parts casein calculated on a 100% solids basis;
- (ii) 0.1 to 15 parts colorant;
- (iii) 0.0001 parts to 0.1 parts of 1,2-benzisothiazolin-3-one;
- (iv) a liquid medium;

wherein all parts are by weight, (i)+(ii)+(iii)+(iv) add up to 100 parts and the ink comprises less than 0.1% by weight of di- and tri-valent metal ions.

12. A process according to any one of claims 1 to 8 wherein the casein and colorant are applied to the substrate in the form of an ink according to claim 10 or 11.

13. An ink jet printer cartridge comprising a chamber and a composition according to claim 10 or 11.

14. Use of casein to improve the ozone fastness of a colorant.